SAN GORGONIO HYDROELECTRIC SYSTEM, FLOWLINE NO. 2,
TANK NO. 2, & PENSTOCK NO. 2
San Bernardino National Forest
Banning vicinity
Riverside County
California

HAER CA-2278-H
HAER CA-2278-H

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

SAN GORGONIO HYDROELECTRIC SYSTEM, FLOWLINE NO.2, TANK NO.2 & PENSTOCK NO. 2

HAER No. CA-2278-H

Location: Flowline No. 2 runs southwest from Powerhouse No. 1 to Tank No. 2. Tank No. 2 and Penstock No. 2 are located approximately 1.25 miles southwest of Powerhouse No. 1 and approximately 1.1 miles northeast of Powerhouse No. 2. Tank No. 2 and Penstock No. 2 are located within the Riverside County portion of the system within Banning Canyon. They are located in Sections 3; T.2S., R.1E. on the Forest Falls USGS topographic map. Tank No. 2 is located at latitude: 34.020571, longitude: -116.819083. The coordinate represents the center of the tank. This coordinate was obtained on June 30, 2010 using a GPS mapping grade unit accurate to +/- 3 meters after differential correction. The coordinate's datum is North American Datum 1983. The Tank No. 2 location has no restriction on its release to the public.

Date of Construction: 1923

Builder: San Gorgonio Power Company

Present Owner: Southern California Edison Company
(fee ownership and easements)
2244 Walnut Grove Avenue
Rosemead, CA 91770

Present Use: Vacant

Significance: Tank No. 2 and Penstock is a contributing feature to the San Gorgonio Hydroelectric System. The system itself was found to be eligible for listing in the National Register of Historic Places under Criteria A and C in 1993. The system was found eligible under Criterion A, for its representation of 1920s hydroelectric development in southern California and the system was also found to be eligible under Criterion C, for its use of tanks rather than forebays, which represented a departure from typical western hydroelectric systems, using a technique more common to the eastern United States. Furthermore, the San Gorgonio System utilized automatic controls which were a new innovation in the 1920s and later became an industry standard. Additionally, the two powerhouses were found to be good examples of utilitarian structures influenced by Classical Revival style architecture.

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Date: September 2010

Project Information: SCE is planning to decommission the project's two power plants and part of their appurtenant water conveyance system. Some of the project components are scheduled to be decommissioned and removed, decommissioned and abandoned in place, or transferred to new ownership. The hydroelectric generators and other pieces of hardware and equipment will be removed from the powerhouse buildings, but the buildings will remain. Components slated for removal will be demolished using bulldozers and other components will be removed using hand crews where there is no present vehicle access. The San

Gorgonio Pass Water Agency plans to acquire those project facilities that are not decommissioned. The transferred facilities would no longer be used for the generation of power. As a result of this project the San Gorgonio Hydroelectric System was documented with Historic American Engineering Records. The entire system was documented in an overview report, San Gorgonio Hydroelectric System HAER No. CA-2278 and each contributing element of the system was documented with separate supporting reports as follows: San Gorgonio Hydroelectric System, East Fork Dam and Intake, HAER No. CA-2278-A; San Gorgonio Hydroelectric System, South Fork Dam and Intake, HAER No. CA-2278-B; San Gorgonio Hydroelectric System, Powerhouse No. 1, HAER No. CA-2278-C; San Gorgonio Hydroelectric System, Tank No. 1 and Penstock No. 1, HAER No. CA-2278-D; San Gorgonio Hydroelectric System, Operator's Bungalow, HAER No. CA-2278-E; San Gorgonio Hydroelectric System, Operator's Garage, HAER No. CA-2278-F; San Gorgonio Hydroelectric System, Powerhouse No. 2, HAER No. CA-2278-G; San Gorgonio Hydroelectric System, Flowline No. 2, Tank No. 2, & Penstock No. 2, HAER No. CA-2278-H.

Part I: Historical Information

Physical History The San Gorgonio Hydroelectric System was constructed from 1911 to 1923. Tank No. 2 and its associated Penstock was completed by 1923. The architect and engineer are not known as original plans no longer remain. However, it is likely that Chief Engineer Charles O. Poole supervised their design and construction. Additionally, the contractor for Flowline No. 2, Tank No. 2 and its Penstock was C.D. Sotiras. There have been no physical alterations or addition since its construction in 1923, aside from in-kind replacements.

Historic Context

In 1911, the Consolidated Reservoir and Power Company (CRPC) began construction on an irrigation system to provide water for the City of Banning and W.E. Pedley was hired as the contractor for the project.[1] By 1913 the irrigation system was complete and by 1917, the system was providing enough water to irrigate the entire farming tract in Banning Heights, which was planted with apple and cherry orchards.[2]

Likely due to financial trouble, the CRPC reorganized as the San Gorgonio Power Company (SGPC) in 1921 and made immediate plans to construct hydroelectric power plants along the existing irrigation system. The existing concrete irrigation conduits became utilized as Flowlines No. 1 and No. 2 for the San Gorgonio Hydroelectric System. Charles O. Poole of the SSPC was the chief engineer for the project and C.D. Sotiras was the primary contractor.[3] The Crane Company of Chicago furnished 7,000' of steel pipe for both Penstock No. 1 and Penstock No. 2. By September of 1922, construction began on Powerhouses No. 1 and No. 2.[4] Since the San Gorgonio Hydroelectric System was originally designed to produce power utilizing both powerhouses, the contributing elements to Powerhouse No. 1 and Powerhouse No. 2 were constructed simultaneously and completed in 1923. Powerhouse No. 2 and its contributing elements including Flowline No. 2, Tank No. 2, and Penstock No. 2 were placed into service 12 days after Powerhouse No. 1, on December 17, 1923.[5]

In 1932, as a result of the economic depression of the 1930s the SGPC fell under the ownership of the San Gorgonio Electric Company. In 1938, massive flooding affected areas of both Riverside and San Bernardino counties (in addition to Los Angeles and Orange counties) when the Santa Ana River, which is linked with the Whitewater River, jumped its banks.[6] The flooding washed out sections of Flowline No. 1 near the east and south fork intakes. The damaged sections were immediately repaired with spiral weld

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[1] "Whitewater River Makes Greater Banning." *The Banning Record*, September 4, 1913, p. 1.
[2] Robinson, John W. *The San Bernardinos*. Arcadia, CA: Big Santa Anita Historical Society, 1986, p. 222.
[3] Weber, Carmen A. and Richard Starzak. *A Historical Assessment of the San Gorgonio Hydroelectric System*. Irvine, CA: Chambers Group, Inc., 1993, p. 3.
[4] "Power Plants Going In," *The Banning Record*, September 28, 1922, p. 1.
[5] B.J. Mount and H. L. Fryer. "Southern/Hoover Hydro Generation Division History," Southern California Edison Manuscript, May 21, 1980.
[6] "Plane Trip Shows Scene of Desolation," *Los Angeles Times*, March 4, 1938, p. 1.

steel pipes that were reinforced to withstand any future flooding or landslides. On January 9, 1950 the San Gorgonio Electric Company sold the plant to the California Electric Power Company and on December 31, 1963 the San Gorgonio Hydroelectric system became part of the Southern California Edison Company by license transfer (this occurred when California Electric Power merged with the Southern California Edison Company).[7] SCE continued to use the former SGPC power generating facilities until they were finally shutdown in 1998; the property remains under ownership of SCE.[8] The irrigation system remains in operation (as of 2009) and the water rights are still owned by the Banning Heights Water Company; the system is owned and maintained by SCE. Please see the Historic Context section in the Historic American Engineering Record for the San Gorgonio Hydroelectric System (HAER No. CA-2278) for additional information.

Part II: Description: Structural/Design Information

Flowline No.2 runs from Powerhouse No. 1 southwest to Tank No. 2. The flowline is made up of a 30" in diameter steel pipe and transitions into a concrete flume approximately 100 feet from Powerhouse No.1. Flowline No. 2 remains a concrete flume for the remainder of the distance to Tank No. 2.

Tank No. 2 has a capacity of 42,896 cubic feet and measures 40' in diameter and is 33'-6" high. The water tank has a concrete foundation and it is constructed of numerous rectangular steel plates curved to form the circumference of the tank. The edges of each plate are riveted with steel rivets; a number of vertical rivets were installed in rows of three. The water tank is not covered. Attached to the northwest side of the tank is a metal ladder that gives access to the interior. On the east side of the tank near the base is an approximately 18-inch plug that has been riveted to the tank. Water from Powerhouse No. 1 via a concrete flowline leads to a sand/screen box constructed of poured concrete. The box is located approximately 50 feet northeast from the Tank No. 2 and is at an equal elevation as the top of the tank. Water from the sand/screen box leads to the tank via a 24 inch steel pipe flowline. The water goes through a metal screen located inside of the tank, from which an 18 inch steel pipe penstock leads to Powerhouse No. 2 located approximately 1.3 miles southwest of Tank No. 2; two 18 inch gate valves, which control the flow of water through the penstock, are located near the west side of the tank.

Penstock No. 2 also has a steel vent pipe with metal rivets located at the west side of the tank. The vent pipe extends up to the top of the tank and is attached to the side of the tank with metal supports. A squared concrete flowline measuring 29" wide and 16" deep carries water to Powerhouse No. 2. Near the west side of the tank a few inches from the base is a rectangular concrete slab that has been inscribed with the following "Chas H. Bigley SGPCo Oct. 19 1923".

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[7] *Southern Sierras Service Bulletin*, Vol. 2, Number 11 August 1923.
[8] Timothy Smith, "Water Restoration Plan Passes 1st Vote," *Record Gazette* , November 29, 2007 website accessed November 2009 http://www.recordgazette.net/articles/2007/11/30/news/01news.prt.

Condition

The overall condition of Flowline No. 2, Tank No. 2, and Penstock No. 2 are good. Tank No. 2 appears to be structurally sound; however a portion of the lower edge of the tank, at the east side, has flaked off due to corrosion.

Site Information

Tank No. 2 and its associated Penstock are located approximately 1.25 miles southwest of San Gorgonio Powerhouse No. 1 and approximately 1.1 miles northeast of San Gorgonio Powerhouse No. 2 The tank is located at an elevation of 5,177 feet above sea level.

Part III: Sources of Information

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"File on Water of Whitewater," *Los Angeles Times*, October 20, 1905, p. I16.

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"Great Project Nears Finish," *Los Angeles Times*, May 27, 1913, p. II9.

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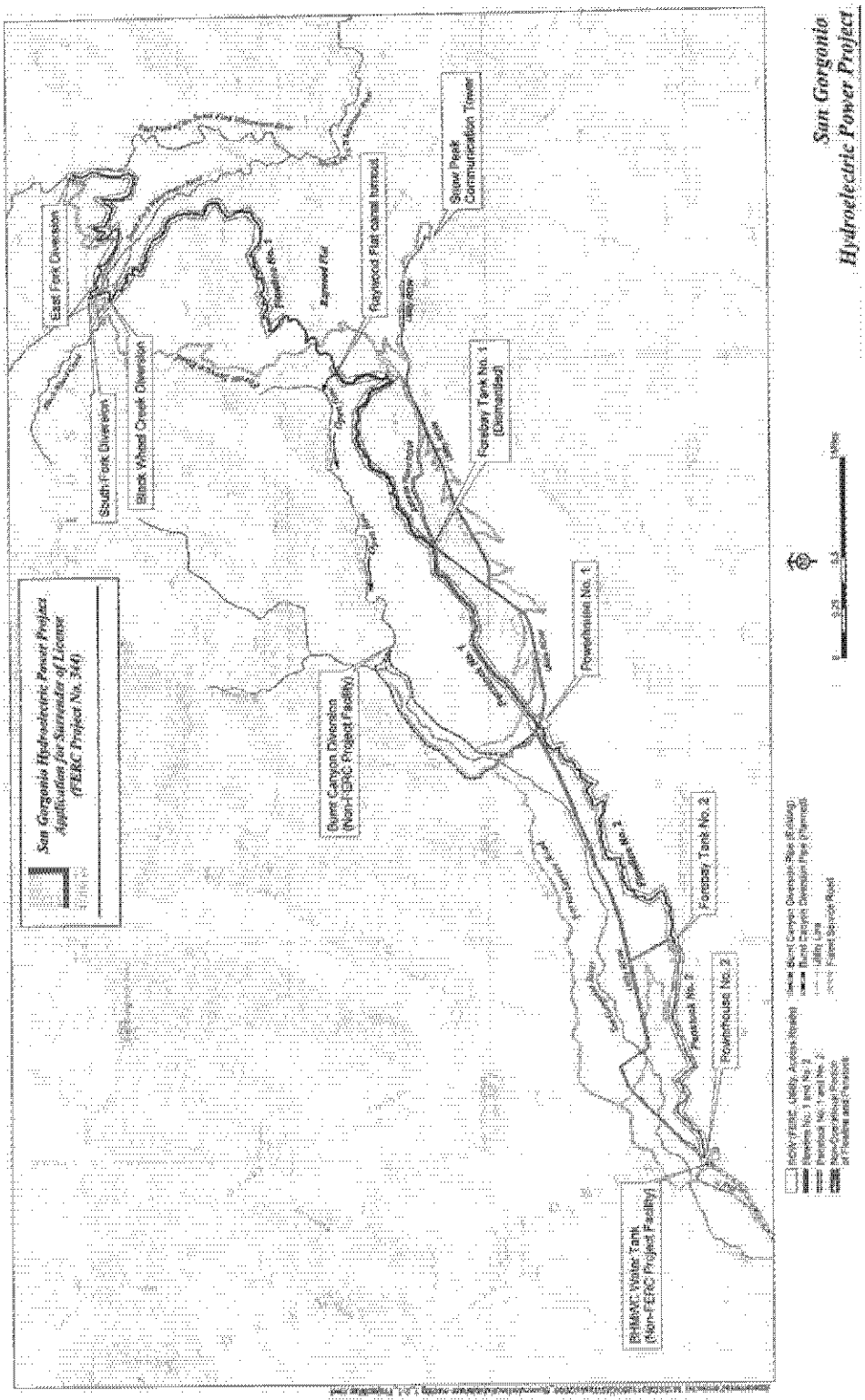
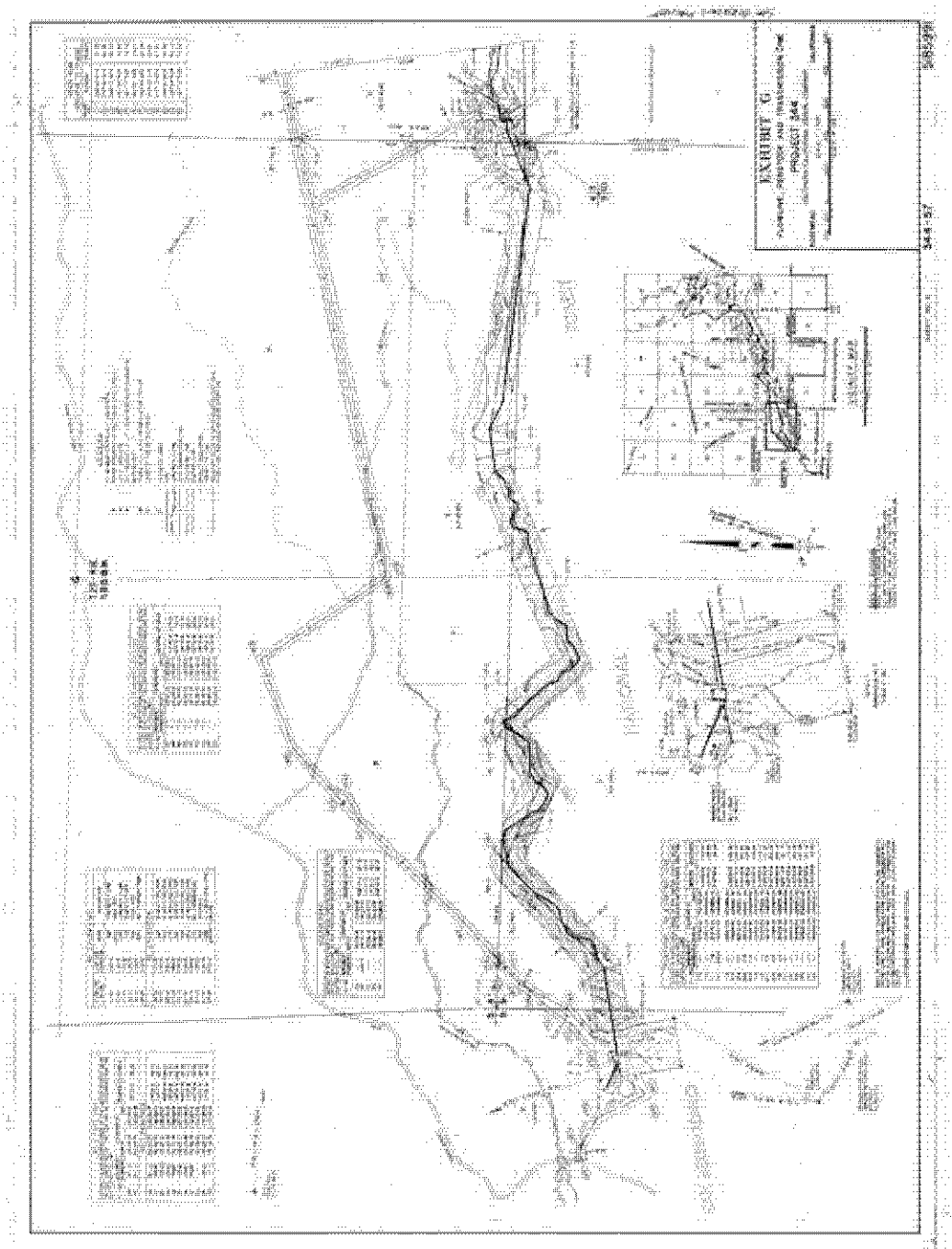
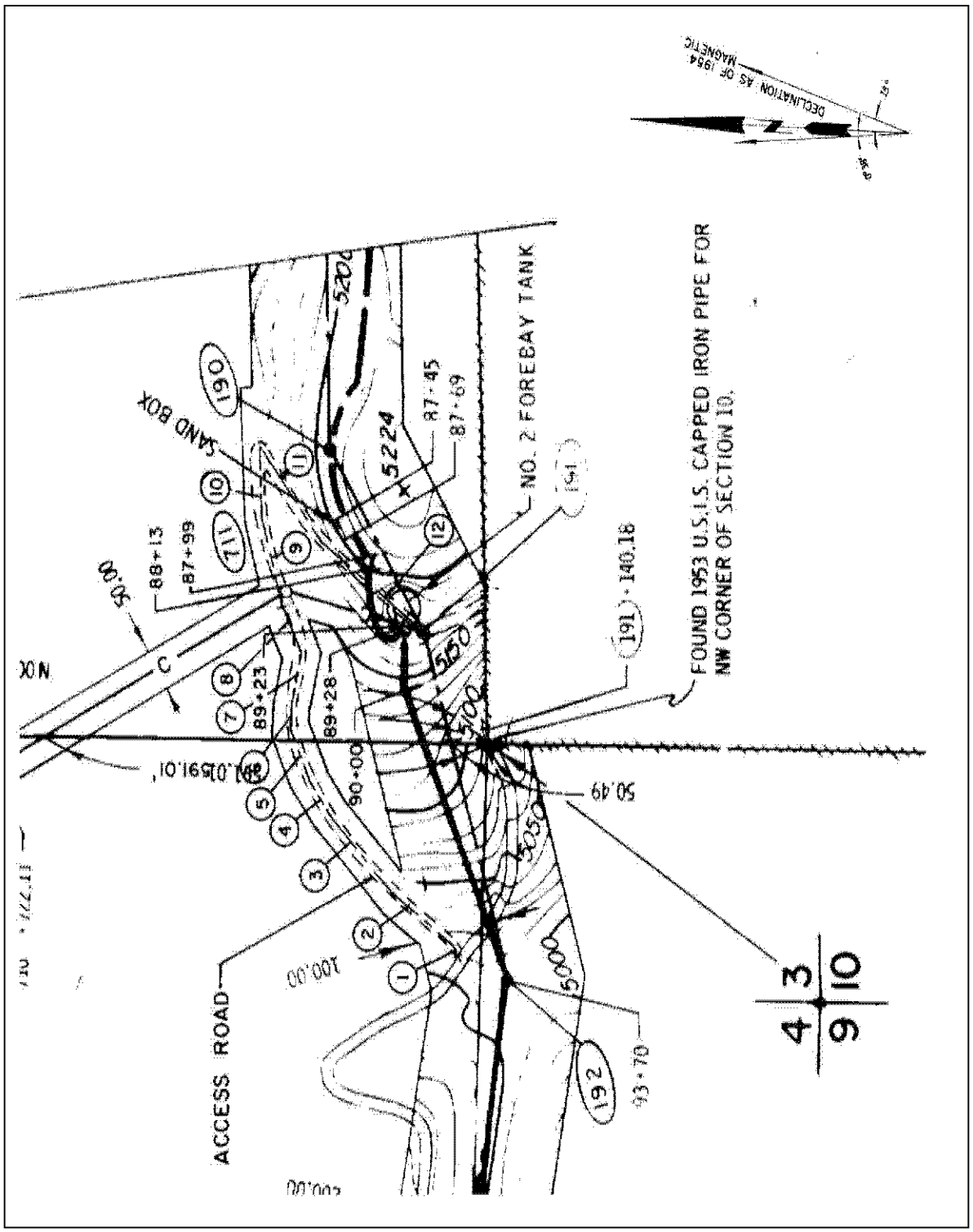
"Whitewater River Utilized," *Los Angeles Times*, July 19, 1913, p. II5.



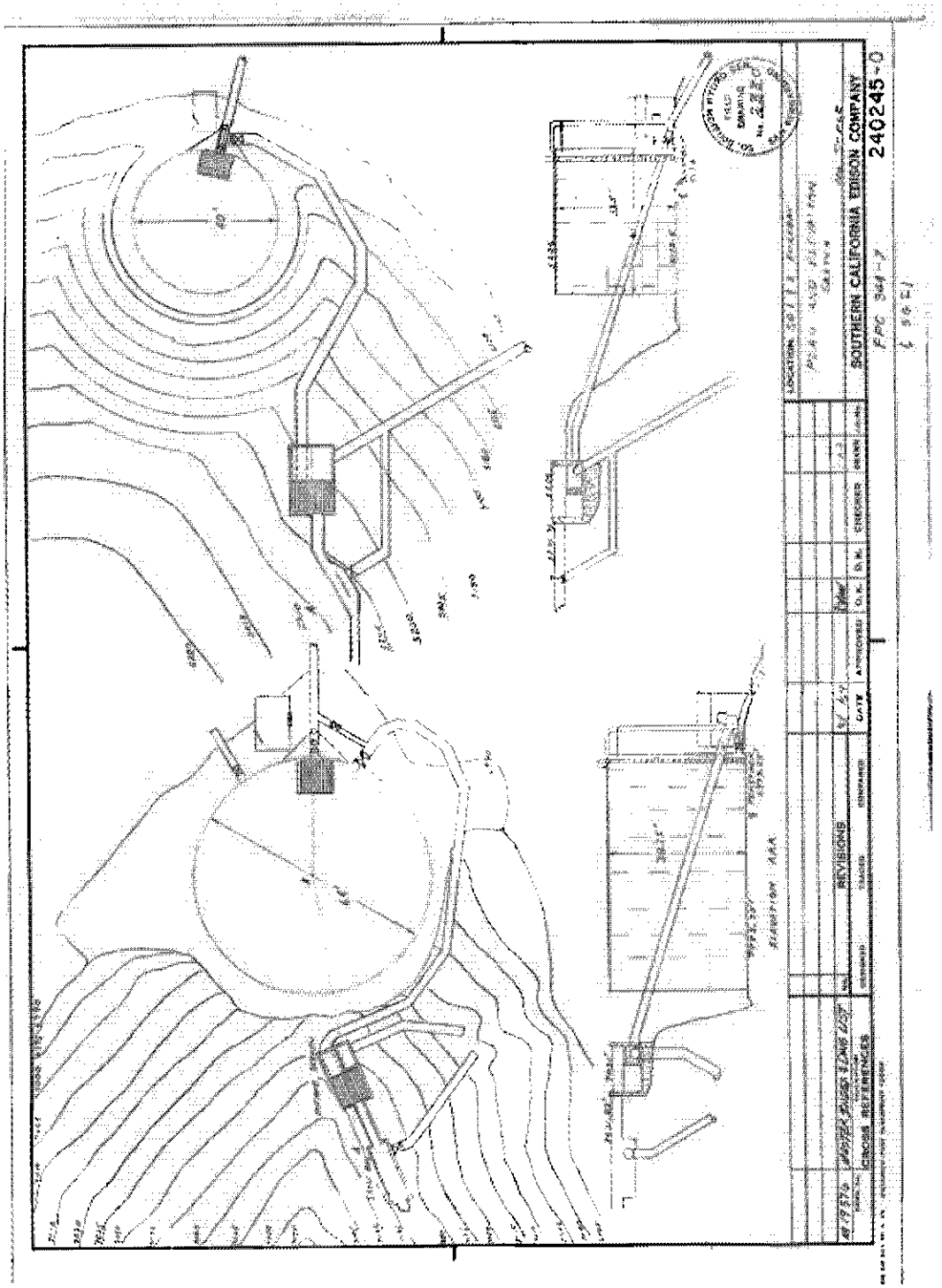
Reduced size overview map of the San Gorgonio Hydroelectric System. Map courtesy of Southern California Edison Company



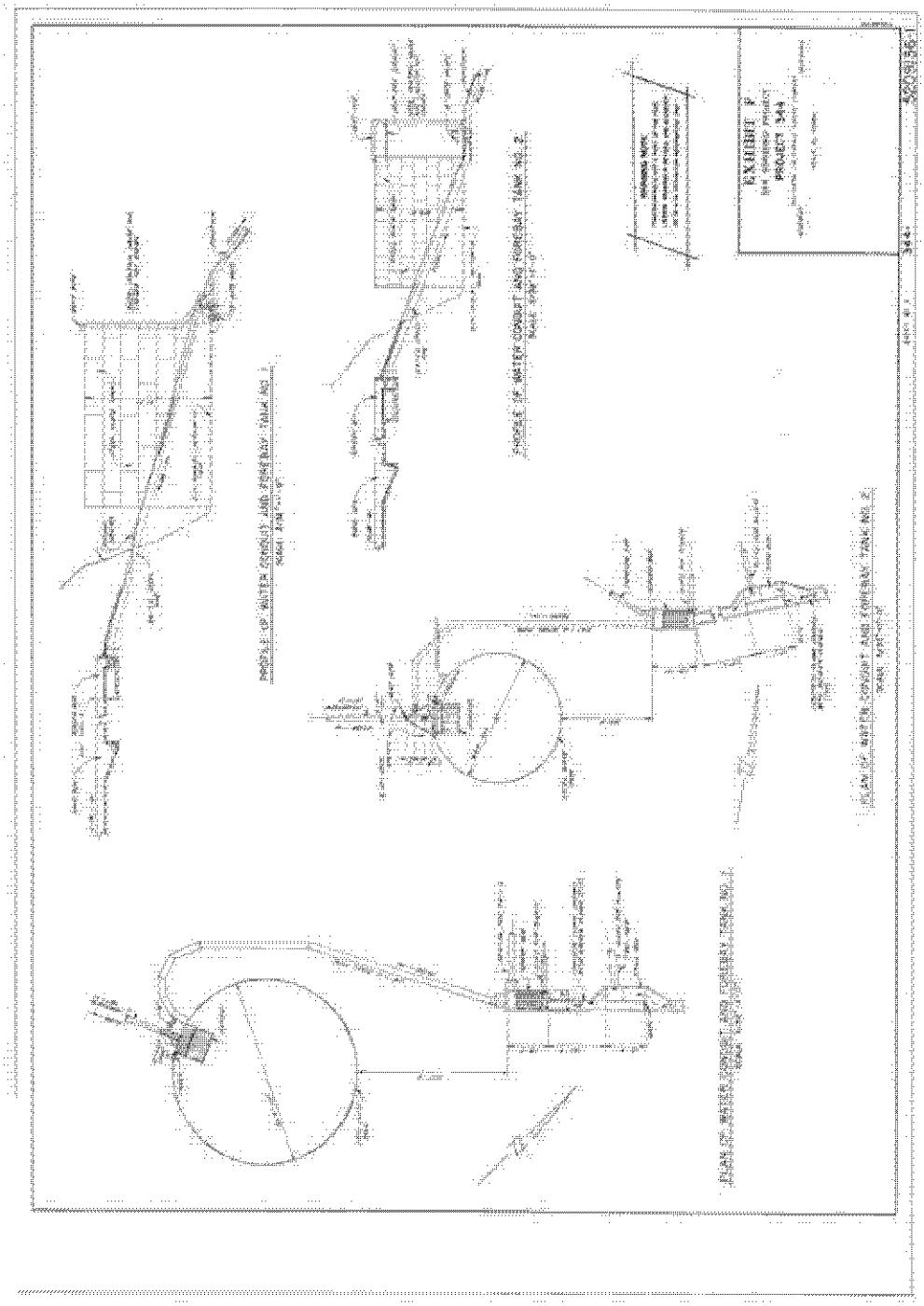
Reduced size plan of Flowline No.2, Penstock No.2, Transmission Line and Powerhouse No.2 site. Original drawing courtesy of Southern California Edison Company. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.



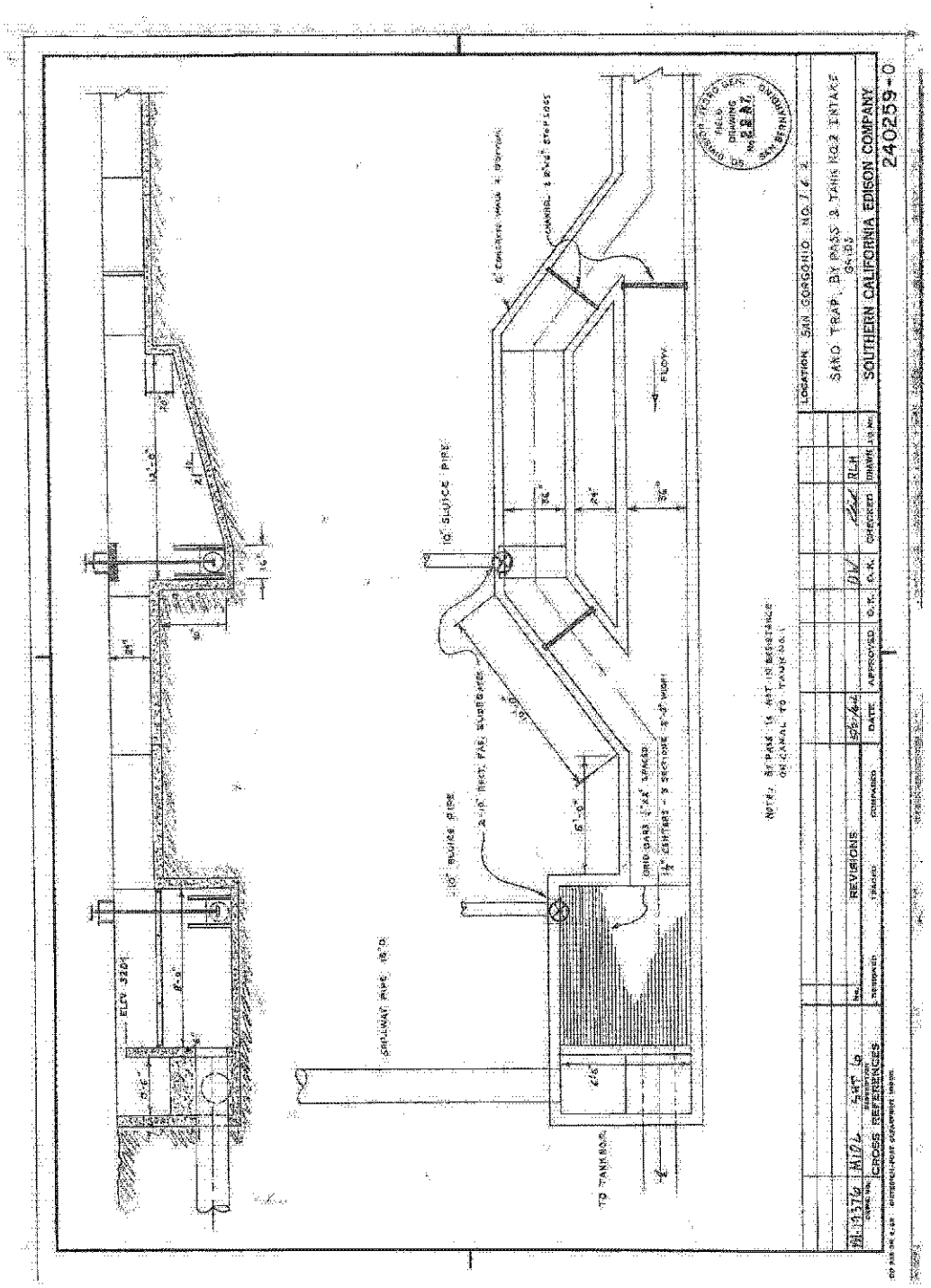
Detail of Tank No.2 site taken from previous reduced size plan. Note Tank No.2 is identified as No.2 Forebay Tank in the above detail. Original drawing courtesy of Southern California Edison Company.



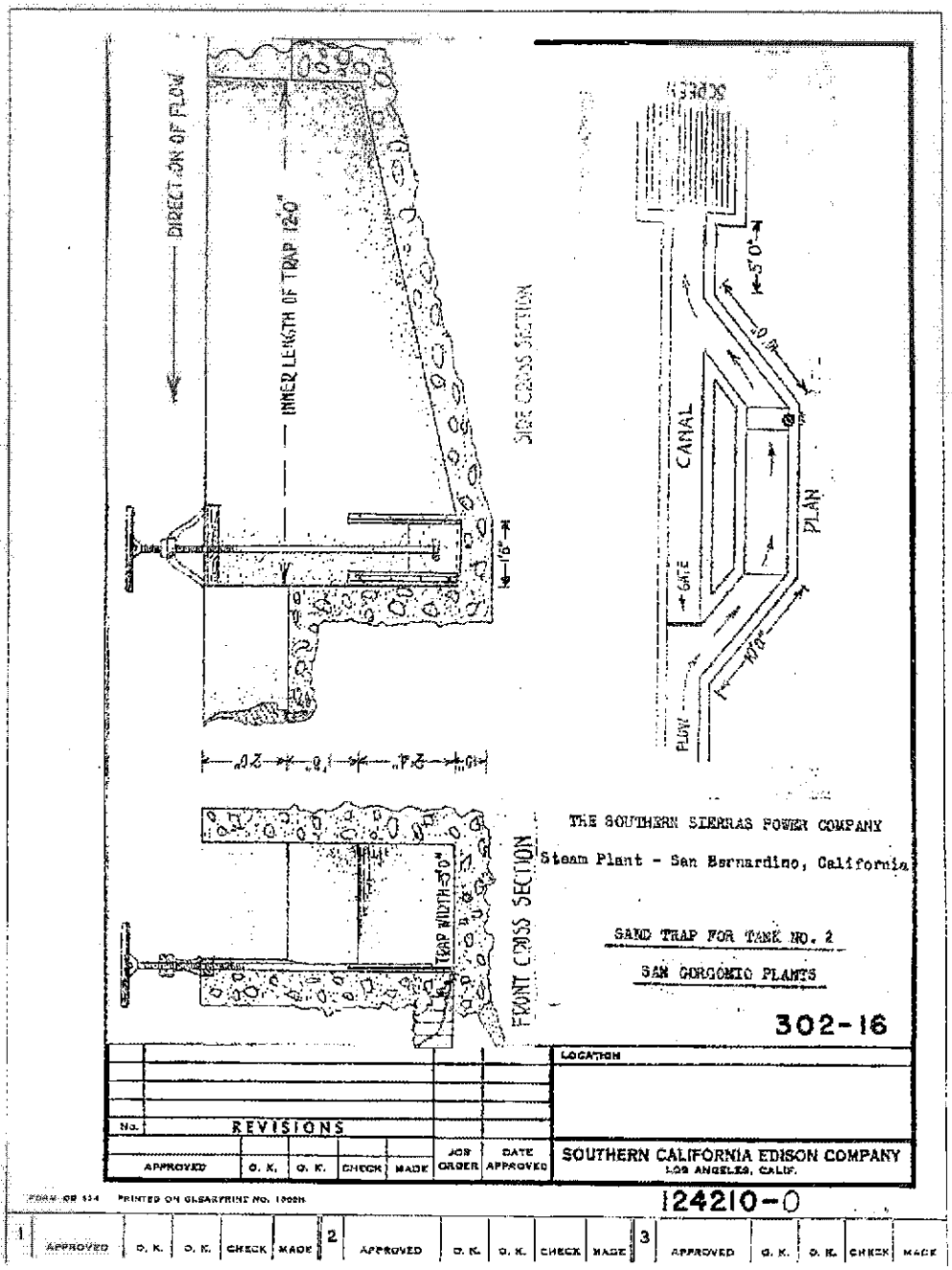
Reduced size plan of Tank No.1 and Tank No.2. Plan dated 1969. Original drawing courtesy of Southern California Edison Company. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.



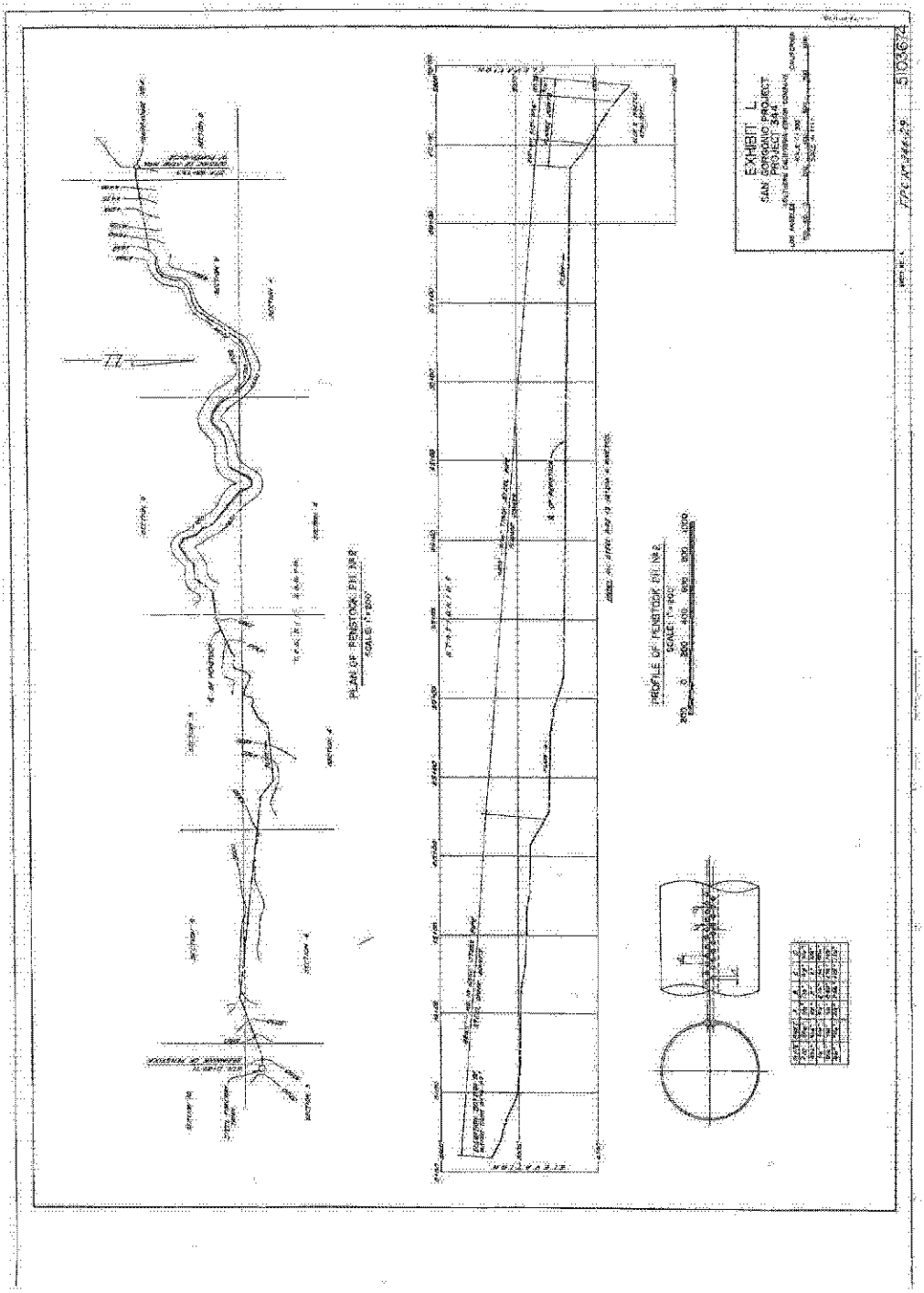
Reduced size plan drawing of Tank No.1 and Tank No.2 with their associated water conduits. Original drawing courtesy of Southern California Edison. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.



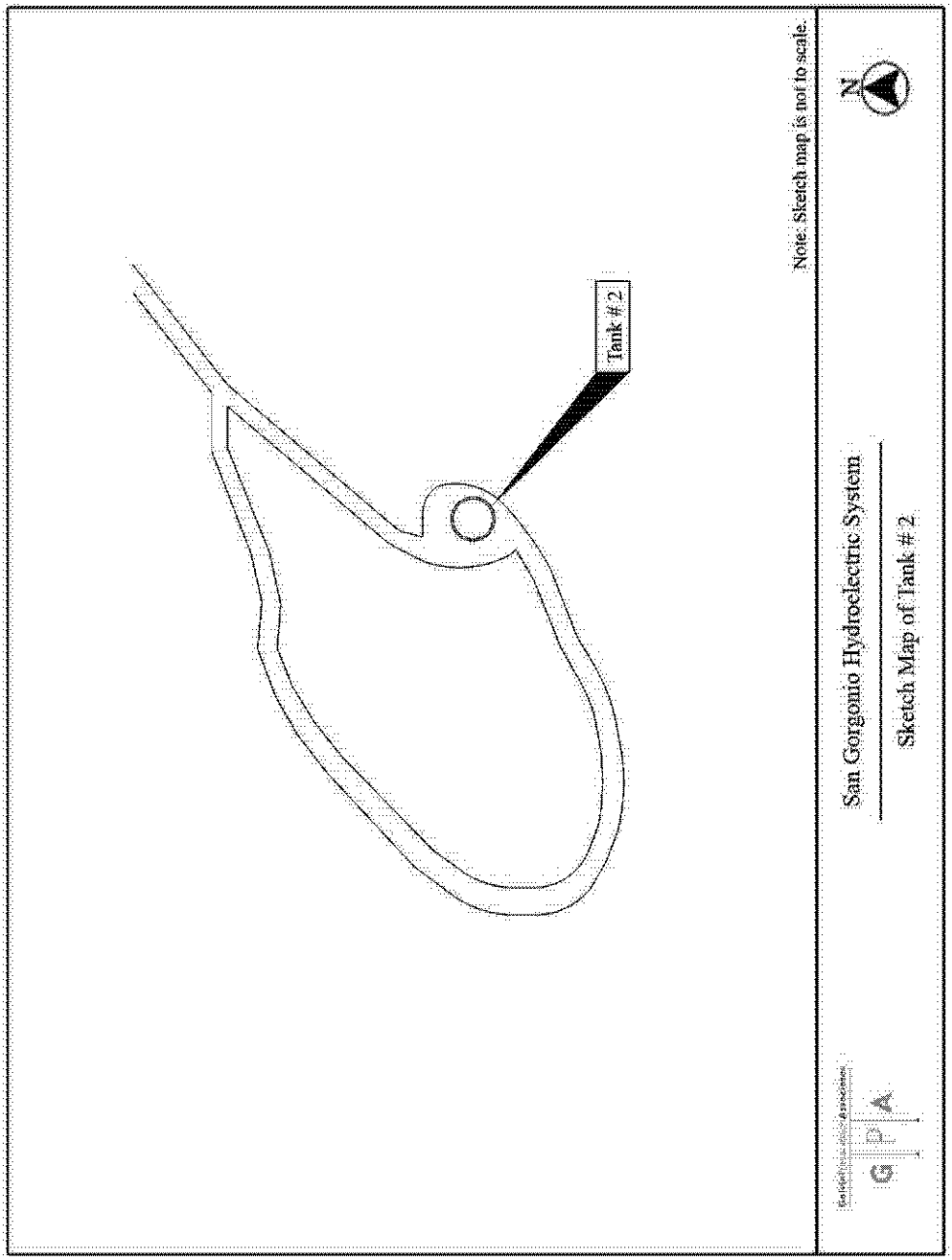
Reduced size drawing of Sand trap, Bypass, & Tank No. 2 Intake. Original drawing courtesy of Southern California Edison Company.



Reduced size plan and cross-section for the Sand trap for Tank No.2. Original drawing courtesy of Southern California Edison Company.



Reduced size drawing of Penstock No.2. Original drawing courtesy of Southern California Edison. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.



Sketch map for Tank No.2. Sketch map created by Galvin Preservation Associates, 2010